

# **EXHIBIT 4**



December 12, 2017

**VIA E-FILING**

The Honorable Richard G. Andrews  
United States District Judge  
J. Caleb Boggs Federal Building  
844 N. King Street  
Unit 9, Room 6325  
Wilmington, DE 19801-3555

**Re: *TQ Delta, LLC v. 2Wire, Inc., et al.*,  
C.A. Nos. 13-cv-1835, 13-cv-2013, 14-cv-954, 15-cv-121-RGA**

Dear Judge Andrews:

Pursuant to the Court's instructions to reduce the number of asserted claim for TQ Delta's initial infringement contentions to an average of two claims per patent<sup>1</sup>, TQ Delta elected claims 5 and 7, of U.S. Patent No. 7,570,686 (the "'686 patent"). At the claim construction hearing, on November 17, 2017, the Court instructed counsel for the parties to discuss the possibility of substituting claims of the '686 patent. Since that time, Plaintiff proposed substituting claims 24 and 36, and explained why such substitution would resolve two claim construction disputes currently pending before the Court but at the same time would not create new issues because the substitute claims are otherwise insubstantially different for purposes of infringement contentions. *See* Ex. A (Dec. 5, 2017 email from TQ Delta to 2Wire). Defendants rejected Plaintiff's proposed substitution, stating that they would purportedly be prejudiced without further explanation. *See* Ex. B (Dec. 7, 2017, email from 2Wire to TQ Delta).

Because the parties are at an impasse, Plaintiff TQ Delta now seeks the Court's permission to substitute claims 5 and 7 of the '686 patent with claims 24 and 36 of the '686 patent. Granting the substitution will moot at least two currently pending claim construction disputes that concern two related terms from claim 5 and 7<sup>2</sup> of the '686 patent – "DMT signal," hereinafter "Term I" and "each bit in the diagnostic message is mapped to at least one DMT signal," hereinafter Term II. Neither Term I nor Term II appear in claims 24 and 36. Therefore, if the Court grants TQ Delta request, the Court would not need to construe these terms.<sup>3</sup>

**A. The substituted claims don't raise any new claim construction issues**

The substituted claims do not raise any new claim construction issues – a point that was correctly recognized by the Court. *See* 11-07-2017 Hearing Tr. at 113:18-22 (**COURT**: "but it

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<sup>1</sup> *See* Mar. 21, 2014 Status/Scheduling Conference Tr. at 16:22-24 (TQ Delta "would be limited to two claims -- well, two claims per patent. Sixty-four claims in all.")

<sup>2</sup> Claim 7 depends from claim 5.

<sup>3</sup> The term "DMT symbol" appears in these claims instead. The parties agree on the well-known meaning of DMT symbol.

seemed to me when there are a lot of claims that have pretty much mostly the exact same terminology as the one we've already had construction on, that there may not be that much more room for a claim construction dispute.”). Ex. C (attached) sets forth, on an element-by-element basis, a comparison of claim 5 and the substitute claims. This validates the Court's initial observations. For example, the only difference between claim 5 and claim 24 is that, while claim 5 recites “each bit in the diagnostic message is mapped to at least one DMT signal,” claim 24 recites “using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message,” hereinafter Term III. Claim 36 also uses Term III instead of disputed Terms I and II.

Term III resolves all disputes with respect to Terms I and II. First, Term III recites “DMT symbol” rather than “DMT signal” and, thus, it moots the issue of whether “DMT signal” should be interpreted in a manner that is synonymous with DMT symbol.

Second, Plaintiff's proposed construction for Term II, “each bit in the diagnostic message is mapped to at least one DMT signal,” is “each bit in the diagnostic message is communicated using a modulation scheme where a DMT signal (or two or more DMT signals) represents only a single bit of the diagnostic message.”<sup>4</sup> Defendants disputed this construction and have asserted that, even if DMT symbol was substituted for DMT signal, “the claim language [Term II of claim 5] does not read on the one bit per DMT symbol embodiment . . . .” Sept. 5, 2017 Family 1 *Markman* Hearing Tr. at 98:8-11. Rather, Defendants assert that Term II is broader and also covers any conventional multicarrier modulation scheme, which will transmit many bits on each DMT symbol. *Id.* at 108:21-24 (“This is -- this claim 5 talks about mapping each bit to at least one DMT symbol. You can load each symbol with any number of bits . . . .”). As explained below, substitution of claims 24 and 36, which include Term III, will moot this dispute because Defendants and their expert have already admitted (indeed, affirmatively asserted) that Term III is limited to the one bit per DMT symbol modulation scheme captured by TQ Delta's proposed construction.

During the Family 1 claim construction hearing, held on September 5, 2017, Defendants affirmatively asserted that, while Term II did not capture the one bit per DMT symbol modulation scheme, Term III did. Defendants argued:

TQ Delta's proposed construction proposes only a single bit per DMT signal/symbol period. That's a total mismatch with the claim language. The claim language [of claim 5] does not imply any limits at all in the number of bits you put on each symbol, and that's what TQ Delta's proposed construction would ask the Court to do, just one bit per symbol. That's what Mr. McAndrews said. That is what the claim language of their construction said.

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<sup>4</sup> In support of its proposed construction, TQ Delta relied on the disclosure of the '686 patent that provides, in relevant part, “[i]n the diagnostic link mode, the RT modem sends diagnostic and test information in the form of a collection of information bits to the CO modem that are, for example, modulated by **using one bit per DMT symbol modulation**, as is used in the C-Rates1 message in the ITU and ANSI ADSL standards” (D.I. 343, A6 at 3:44-48) and “in the **one bit per DMT symbol modulation message encoding scheme**, a bit with value 0 is mapped to the REVERB1 signal and a bit with a value of 1 mapped to a SEGUE1 signal” (*id.* at 3:54-57).



That just doesn't fit with the claim language [of claim 5] at all. And, in fact, your Honor, if TQ Delta had wanted to claim one bit per DMT modulation, this more robust scheme, it could easily have done those with those words, and it did so multiple times in the '686 patent.

If you go to the next slide, these are other independent claims. . . . Your Honor, we've highlighted the language in claim 20, 24, 28, 32 and 36, and if you include the dependent claims, there's 19 claims in the patent that claim, you know, the same bit of data, bits of data, the array representing frequency domain and received idle channel noise information, modulated using [a] scheme where DMT symbols that are mapped to one bit of the diagnostic message, one-to-one mapping. That is different than claim 5 and different than those other claims we were looking at in the '686 patent that use the phrase DMT symbol.

So, again, just to sum up, even if you were to conclude that DMT signal means the same thing as DMT symbol, their construction still should be rejected. They're simply mapping claim 5 to the wrong embodiment in the spec[ification].

Sept. 5, 2017 Family 1 *Markman* Hearing Tr. at 107:9 – 108:21 (referencing Ex. D, slides 32-33 of Defendants' slide presentation). In light of the foregoing affirmative assertions by Defendants that Term III (i.e., "using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message") is properly interpreted to cover the one bit per DMT symbol modulation scheme, the dispute over Term II of claim 5 is moot, and Term III of claims 24 and 36 can be interpreted as "each bit in the diagnostic message is communicated using a modulation scheme where a DMT symbol represents only a single bit of the diagnostic message."

#### **B. There is no prejudice to Defendants**

The Court instructed the parties to discuss the issue of claim substitution and for Plaintiff "to propose to [Defendants] what claim if you were to substitute you would substitute with and figure out whether there really is likely to be any more particular claim construction that is necessary, and figure out whether it really would affect anything in terms of the time frame of getting this case, or keeping these cases placed in the queue, so to speak." meet and confer on the issue of substitution of claims." Nov. 17, 2017 Hearing Tr. at 114:1-3. TQ Delta discussed the issue of claim substitution with Defendants on several occasions – telephonically and via email. Attached, as Ex. B, is a recent email exchange with Defendants' counsel. In response to TQ Delta's proposal and explanation of why the substitution will resolve substantive disputes and not create any new ones, Defendants failed to respond meaningfully. Instead, Defendants stated without explanation that "TQ Delta's proposal would severely prejudice Defendants, and Defendants reserve all rights and arguments in opposition to TQ Delta's proposal." Defendants' argument of prejudice, nevertheless, rings hollow.

As discussed above, substitution will resolve two outstanding claim construction disputes by eliminating Terms I and II, and will not create any new ones by the inclusion of Term III. Further, as can be seen in the attached Ex. A, the other claim elements are either exactly the same

(claim 24) or insubstantially different (claim 36<sup>5</sup>). Thus, no new claim construction issues are created by the other claim elements. Further, with respect to infringement contentions, because of the Term III is properly interpreted to mean the same thing TQ Delta proposed for Term II and the other claim elements are the same or insubstantially different, the infringement contention charts will not be substantively different. In other words, the elements of the substitute claims will read on the same structures and functionality of the accused products as the claim 5. Thus, Defendants cannot identify any real prejudice if substitution is allowed.<sup>6</sup>

**C. Granting TQ Delta's request comports with Federal Circuit law**

Finally, TQ Delta submits that Federal Circuit precedent supports TQ Delta's request to substitute or add the substitute claims. The Court restricted TQ Delta's infringement contentions to two claims per patent to make the case more manageable for the Court, the parties, and ultimately, the jury. To comport with due process, however, "the limitation on the number of claims [should not be] immutable." *Masimo Corp. v. Philips Elecs. N. Am. Corp.*, 918 F. Supp. 2d 277, 284 (D. Del. 2013). Such a limitation is proper as long as a "district court leaves open the door for the assertion of additional claims upon a showing of good cause or need. *See Tech. Licensing Corp. v. Blackmagic Design Pty Ltd.*, No. 13-CV-05184-SBA(MEJ), 2015 WL 307256, at \*2 (N.D. Cal. Jan. 22, 2015) (citing *In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1312–13 (Fed. Cir. 2011)). Good cause exists where the new claims "raise non-duplicative issues of validity or infringement." *In re Katz*, 639 F.3d at 1310. Defendants argue that claim 5 is invalid for indefiniteness due to a claim term that does not appear in claims 24 and 36. They have also effectively asserted that claim 24 and 36 read on a different embodiment (one bit per DMT symbol) than claim 5 (many bits per DMT symbol). Thus, the substitute claims "raise non-duplicative issues of validity or infringement," and good cause exists for the requested substitution.

For the aforementioned reasons, TQ Delta respectfully requests that the Court grant TQ Delta's request to substitute claims 5 and 7 of the '686 patent with claims 24 and 36 of the '686 patent.

Respectfully submitted,

/s/ Michael J. Farnan

Michael J. Farnan

cc: Counsel of Record (via E-File)

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<sup>5</sup> Claim 36 is directed to "An information storage media comprising instructions." The instructions "when executed" cause a transceiver to carry out recited functions. The recited functions are substantively the same as the parallel elements of claim 24.

<sup>6</sup> To the extent Defendants could identify some reason why additional time is necessary to accommodate substitution, this can be addressed by simply changing the sequence of the schedule (which is in the process of being modified in any event) to place deadlines for the Family 1 Patents after the deadlines for the Family 2 and Family 3 Patents (all of which are to be tried against 2Wire first).



**Rajendra A. Chiplunkar**

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**From:** Rajendra A. Chiplunkar  
**Sent:** Tuesday, December 05, 2017 7:31 PM  
**To:** DG-TQDelta-2Wire@goodwinlaw.com; TQDeltavZyXEL@alston.com; ADTRAN-TQD@bradley.com; Rene.Mai@weil.com; RWalsh@goodwinlaw.com; BSchuman@goodwinlaw.com; psykes@bradley.com  
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**Subject:** TQ Delta v. 2Wire et al. - Family 1 Claims

Rachel,

During the November 17, 2017 hearing, the Court asked the parties to discuss replacing the asserted claims from the 686 patent with other claims from the same patent. Please let us know if Defendants will oppose replacing claims 5 and 7 of the 686 patent with claims 24 and 36.

As an initial matter, none of the replacement claims recite “DMT signal” and instead recite “DMT symbol.” This will moot the issue relating to the construction of “DMT signal.”

Separate from the DMT symbol vs. signal issue, Defendants dispute TQ Delta’s construction of the “mapped” limitation of claim 5 because they assert that “mapping each bit to at least one DMT symbol” is not limited to only one bit per DMT symbol as TQ Delta proposed. However, 2Wire’s counsel represented to the Court during the Family 1 Markman hearing that the alternative language of claims 24 and 36, “DMT symbols are mapped to one bit,” is properly interpreted as the one bit per DMT symbol modulation scheme. Family 1 Markman Tr. at 107-109 (“[Y]our Honor, if TQ Delta had wanted to claim one bit per DMT modulation, this more robust scheme, it could easily have done those with those words, and it did so multiple times in the ‘686 patent. Your Honor, we’ve highlighted the language in claim 20, 24, 28, 32 and 36, and if you include the dependent claims, there's 19 claims in the patent that claim, you know, the same bit of data, bits of data, the array representing frequency domain and received idle channel noise information, modulated using scheme where DMT symbols that are mapped to one bit of the diagnostic message, one-to-one mapping. That is different than claim 5 and different than those other claims we were looking at in the '686 patent that use the phrase DMT symbol.”). In light of this representation, replacing the claims will also moot any dispute as it relates to the construction of the “mapped” limitation recited in claims 24 and 36.

Given that the replacement claims moot any dispute, we hope in the interest of judicial economy and reducing the burden on the Court, you agree to TQ Delta’s replacement proposal. We look forward to receiving your agreement by close of business tomorrow, failing which we will approach the Court.

Best regards,

Raj



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## Rajendra A. Chiplunkar

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**From:** RWalsh@goodwinlaw.com  
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**Subject:** RE: TQ Delta v. 2Wire et al. - Family 1 Claims

Raj,

Defendants will oppose TQ Delta's proposal to substitute claims 24 and 36 of the '686 patent for claim 5. TQ Delta's proposal would severely prejudice Defendants, and Defendants reserve all rights and arguments in opposition to TQ Delta's proposal.

Regards,

Rachel

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**From:** Rajendra A. Chiplunkar [mailto:RChiplunkar@mcandrews-ip.com]  
**Sent:** Tuesday, December 05, 2017 5:31 PM  
**To:** DG-TQDelta-2Wire; TQDeltavZyXEL@alston.com; ADTRAN-TQD@bradley.com; Rene.Mai@weil.com; Walsh, Rachel M.; Schuman, Brett; psykes@bradley.com  
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robust scheme, it could easily have done those with those words, and it did so multiple times in the '686 patent. Your Honor, we've highlighted the language in claim 20, 24, 28, 32 and 36, and if you include the dependent claims, there's 19 claims in the patent that claim, you know, the same bit of data, bits of data, the array representing frequency domain and received idle channel noise information, modulated using scheme where DMT symbols that are mapped to one bit of the diagnostic message, one-to-one mapping. That is different than claim 5 and different than those other claims we were looking at in the '686 patent that use the phrase DMT symbol.”). In light of this representation, replacing the claims will also moot any dispute as it relates to the construction of the “mapped” limitation recited in claims 24 and 36.

Given that the replacement claims moot any dispute, we hope in the interest of judicial economy and reducing the burden on the Court, you agree to TQ Delta's replacement proposal. We look forward to receiving your agreement by close of business tomorrow, failing which we will approach the Court.

Best regards,

Raj



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# EXHIBIT C

## EXHIBIT C

Claim 5	Claim 24	Claim 36
5. A diagnostic system capable of communicating diagnostic information over a communication channel using multicarrier modulation comprising:	A diagnostic system capable of communicating diagnostic information over a communication channel using multicarrier modulation comprising:	An information storage media comprising instructions that when executed communicate diagnostic information over a communication channel using multi carrier modulation comprising:
a transceiver capable of transmitting or receiving an initiate diagnostic mode message; and	a transceiver capable of transmitting or receiving an initiate diagnostic mode message; and	instructions that when executed direct a transceiver to receive or transmit an initiate diagnostic mode message; and
a message determination module capable of determining and, in cooperation with the transceiver,	a message determination module capable of determining and, in cooperation with the transceiver,	instructions that when executed transmit from the transceiver
transmitting a diagnostic message from the transceiver, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel and each bit in the diagnostic message is mapped to at least one DMT signal, and	transmitting from the transceiver a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and	a diagnostic message using multi carrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and
wherein one variable comprises an array representing frequency domain received idle channel noise information.	wherein one variable comprises an array representing frequency domain received idle channel noise information.	wherein one variable comprises an array representing is frequency domain received idle channel noise information.

# EXHIBIT D

# TQ Delta, LLC v. 2Wire, Inc. et al.

## Family 1 Patents

## Claim Construction Hearing



**GOODWIN**

Defendants' Hearing Demonstratives  
September 5, 2017



## Even Under TQ Delta's Construction of "DMT Signal," its Construction of the Larger Claim Term *Still* Should Be Rejected

- Even if DMT Signal means the same thing as DMT Symbol Period, the claim language requires that "each bit in the diagnostic message is mapped to *at least one* DMT signal"
- This claim language implies no limits on the number of bits per DMT signal / symbol period.
- TQ Delta's construction proposes only a single bit per DMT signal / symbol period.
- Total mismatch with the claim language.
- If TQ Delta had wanted to claim "one bit per DMT symbol" modulation, it easily could have used those words. In fact, it did so – multiple times....

## Other Claims in the '686 Patent Claiming the “One Bit Per DMT Symbol” Modulation Scheme

- 19 claims, including dependent claims

20. In a multicarrier modulation transceiver, a method of communicating diagnostic information over a communication channel using multicarrier modulation comprising: transmitting or receiving at the multicarrier modulation transceiver an initiate diagnostic mode message; and transmitting from the multicarrier modulation transceiver a diagnostic message using multicarrier modulation with **DMT symbols that are mapped to one bit of the diagnostic message**, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing frequency domain received idle channel noise information.

24. A multicarrier communication transceiver capable of communicating diagnostic information over a communication channel using multicarrier modulation comprising: means for transmitting or receiving at the multicarrier communication transceiver an initiate diagnostic mode message; and means for transmitting from the multicarrier communication transceiver a diagnostic message using multicarrier modulation with **DMT symbols that are mapped to one bit of the diagnostic message**, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing frequency domain received idle channel noise information.

from the transceiver a diagnostic message using multicarrier modulation with **DMT symbols that are mapped to one bit of the diagnostic message**, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing frequency domain received idle channel noise information.

32. In a multicarrier communication transceiver, a method of communicating diagnostic information over a communication channel using multicarrier modulation comprising: transmitting or receiving at the multicarrier communication transceiver an initiate diagnostic mode message; and transmitting from the multicarrier communication transceiver a diagnostic message using multicarrier modulation with **DMT symbols that are mapped to one bit of the diagnostic message**, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing frequency domain received idle channel noise information.

36. A multicarrier communication transceiver capable of communicating diagnostic information over a communication channel using multicarrier modulation comprising: means for transmitting or receiving at the multicarrier communication transceiver an initiate diagnostic mode message; and means for transmitting from the multicarrier communication transceiver a diagnostic message using multicarrier modulation with **DMT symbols that are mapped to one bit of the diagnostic message**, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing frequency domain received idle channel noise information.

ceiver a diagnostic message using multicarrier modulation with **DMT symbols that are mapped to one bit of the diagnostic message**, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing frequency domain received idle channel noise information.

ceiver a diagnostic message using multicarrier modulation with **DMT symbols that are mapped to one bit of the diagnostic message**, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing is frequency domain received idle channel noise information.